

WHAT IS CLAIMED IS:

1. A low-lead-content plating process, comprising:
  - providing an anode;
  - providing a cathode; and
  - 5 providing a plating bath containing a plating liquid, wherein the plating liquid includes a pure tin plating liquid, iron ions, thallium ions and lead ions, with the concentrations of lead ions of 2.5 to 10,000 mg/l, thallium ions of 1 to 550 mg/l, and iron ions of 1 to 550 mg/l.
2. The process of claim 1, wherein the plating liquid further comprising
  - 10 a brightener;
  - a methane sulfoante solution; and
  - a deioned water;

wherein the concentration of the brightener is in the range of 50 to 250 mg/l, and the concentration of the methane sulfonate solution is in the range of 80 to 250 mg/l.
- 15 3. The process of claim 1, wherein the plating process is combined with a barrel plating, the rack plating, a PCB plating, a strip-to-strip plating or a reel-to-reel plating.
4. The process of the claim 3, wherein the plating process is combined with the barrel plating, the rack plating, the PCB plating, the strip-to-strip plating or the reel-to-reel

plating by using a barrel plater, a rack plater, a PCB plater, a strip-to-strip plater or a reel-to-reel plater.

5. A final plated layer with low lead content, comprising:

tin as the majority component in weight;

5 lead of 25 to 100,000 ppm in weight;

thallium of 10 to 5,500 ppm in weight; and

iron of 10 to 5,500 ppm in weight.

6. The final plated layer of claim 5, wherein the final plated layer has a melting point of 183 to 232 °C.

10 7. The final plated layer of claim 5, wherein the lead has 25 to 50,000 atoms per cube meter of the composition.

8. The final plated layer of claim 5, wherein the thallium has 10 to 2,500 atoms per cube meter of the composition.

9. The final plated layer of claim 5, wherein the iron has 10 to 2,500 atoms per cube  
15 meter of the composition.